

REPORT DOCUMENTATION PAGE

1. Report Security Classification: UNCLASSIFIED			
2. Security Classification Authority:			
3. Declassification/Downgrading Schedule:			
4. Distribution/Availability of Report: DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.			
5. Name of Performing Organization: JOINT MILITARY OPERATIONS DEPARTMENT			
6. Office Symbol: C		7. Address: NAVAL WAR COLLEGE 686 CUSHING ROAD NEWPORT, RI 02841-1207	
8. Title: A Commander in Chief's Network-Centric Odyssey (U)			
9. Personal Authors: Lieutenant Commander R. Curt Copley, United States Navy			
10. Type of Report: FINAL		11. Date of Report: 4 February 2002	
12. Page Count: 25		12A Paper Advisor: Dr. John R. Ballard	
13. Supplementary Notation: A paper submitted to the Faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.			
14. Ten key words that relate to your paper: Network-Centric Warfare, Operational Art, Network-Centric Operations, Levels of War, Operational Pauses, Nonlinear, Timing and Tempo, CINC, Balance, Leverage			
15. Abstract: Network-Centric Operations continues to gain acceptance as a construct for future military operations. Operational Art, on the other hand, stands as a principal construct for past military successes and constitutes current joint doctrine. Some critics suggest implementing Network-Centric Operations presages the death of Operational Art. Each Armed Service has begun training and equipping its force using the tenets of Network-Centric Operations, but those forces come together for the first time under the combatant Commander-in-Chief. The CINC will have to determine how a fully networked force affects existing methods of employment to achieve operational and strategic objectives. This paper reconciles Network-Centric Operations and Operational Art by analyzing the underlying assumptions, assertions, and interrelationships. The analysis results in the conclusion that Network-Centric Operations and Operational Art are not mutually exclusive but mutually supporting constructs. In fact, a synergy appears that accomplishes strategic and operational objectives with extraordinary effectiveness. This conclusion leads to six recommendations for the Commander-in-Chief that harmonizes Network-Centric Operations and Operational Art to ensure future success in the theater.			
16. Distribution / Availability of Abstract:	Unclassified X	Same As Rpt	DTIC Users
17. Abstract Security Classification: UNCLASSIFIED			
18. Name of Responsible Individual: CHAIRMAN, JOINT MILITARY OPERATIONS DEPARTMENT			

Security Classification of This Page Unclassified

**NAVAL WAR COLLEGE
Newport, R.I.**

A Commander-in-Chief's Network-Centric Odyssey

By

Curt Copley
LCDR USN

A paper submitted to the faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

Signature: _____

February 4, 2002

Professor Dave Goodrich
Captain Pat Nash Jr., USN
Seminar 11

Professor John Ballard
Faculty Advisor

Abstract of

A Commander-in-Chief's Network-Centric Odyssey

Network-Centric Operations continues to gain acceptance as a construct for future military operations. Operational Art, on the other hand, stands as a principal construct for past military successes and constitutes current joint doctrine. Some critics suggest implementing Network-Centric Operations presages the death of Operational Art. Each Armed Service has begun training and equipping its force using the tenets of Network-Centric Operations, but those forces come together for the first time under the combatant Commander-in-Chief. The CINC will have to determine how a fully networked force affects existing methods of employment to achieve operational and strategic objectives.

This paper reconciles Network-Centric Operations and Operational Art by analyzing the underlying assumptions, assertions, and interrelationships. The analysis results in the conclusion that Network-Centric Operations and Operational Art are not mutually exclusive but mutually supporting constructs. In fact, a synergy appears that accomplishes strategic and operational objectives with extraordinary effectiveness. This conclusion leads to six recommendations for the Commander-in-Chief that harmonizes Network-Centric Operations and Operational Art in the theater of operations to ensure future success.

Throughout the history of warfare, new concepts have traditionally stimulated reflection on existing constructs. The rise of Network-Centric Warfare (NCW) is no different. Some currently used constructs will fade away, others will be created, while others will stand or be modified. Into which category will Operational Art (Op Art) fall? At least one critic has suggested the implementation of NCW foreordains the death of Op Art.¹ Can NCW make Op Art obsolete? As outlandish as this claim sounds, it may gain adherents unless the underlying assumptions and assertions of each construct are examined and the interrelationships understood. This paper analyzes NCW and Op Art to determine if they are mutually exclusive and, if not, how each will affect the other. Additionally, in the future, Op Art combined with NCW may form a synergy that achieves strategic and operational objectives with unprecedented effectiveness, a concept that this paper recommends for further evaluation.

Proponents of NCW have argued long and hard for a new revolution in military affairs (RMA) to be recognized, a new theory of warfare to be understood, and a new operational concept to be adopted by the United States military. Vice Admiral Arthur Cebrowski, as the oracle of NCW, led the effort to get NCW accepted within the Navy, but now the concept has spread to the other Services. Each Armed Service has established a program to develop and implement NCW or more broadly Network-Centric Operations (NCO), which includes application of NCW during peace. The Army has Digital Warrior, the Air Force has Infosphere and the Navy has FORCEnet, while the Marine Corps continues to explore NCO with its Warrior experiments. The Joint Staff has also jumped aboard with the Global Information Grid, and the Office of the Secretary

¹ Erik J. Dahl, "Network Centric Warfare and the Death of the Operational Art," (Unpublished Research Paper, U.S. Naval War College, Newport, RI: November 2001), 1.

of Defense plans to regulate all these activities using a program called the Family of Interoperable Programs.

NCO is best described as “military operations that exploit state-of-the-art information and networking technology to integrate widely dispersed human decision-makers, situational and targeting sensors, and forces and weapons into a highly adaptive, comprehensive system to achieve unprecedented mission effectiveness.”² NCO will affect all Services significantly because information has to be shared across Services lines. Stated another way, whereas historical examples of adding military capabilities have presented most typically vertical integration challenges, NCO introduces a horizontal integration challenge. For example, tanks and aircraft increased force capabilities by adding platforms, vertical integration. NCO will be implemented through networking and sharing information across the Services at many levels, which is an example of horizontal integration. In fact, NCO may be the first RMA activity that requires joint participation in order to succeed.

Although the concept of NCO does not enjoy universal acceptance within the Department of Defense (DoD),³ senior military and civilian leaders have expressed support. The former Chief of Naval Operations (CNO) Admiral Jay Johnson, said, “I believe that realization of the full potential of network-centric warfare will prove critical to the operational success of future naval forces.”⁴

² Naval Studies Board, Network-Centric Naval Forces: A Transition Strategy for Enhancing Operational Capabilities (Washington, DC: National Academy Press, 2000), 1.

³ Colonel T.X. Hammes, “War Isn’t a Rational Business,” U.S. Naval Institute Proceedings (July 1998), 23.

⁴ Admiral Jay L. Johnson to President, National Academy of Sciences, 29 April 1998, “Letter to President, National Academy of Sciences.” Quoted in Naval Studies Board, Network-Centric Naval Forces: A Transition Strategy for Enhancing Operational Capabilities (Washington, DC: National Academy Press, 2000), App. A.

The current CNO, Admiral Vern Clark, tasked his Strategic Studies Group “to identify solutions to rapid introduction of this capability...as soon as possible.”⁵

Additionally, Congress has shown interest in DoD’s development and implementation of NCO.⁶ Even President G. W. Bush endorsed NCO by saying; “...U. S. naval forces should focus on network centric warfare that connects information and weapons in new ways, maximizing our ability to project power over land.”⁷ While the debate continues, NCO gathers momentum. As evidence, the Secretary of Defense (SECDEF) appointed Admiral Cebrowski as the Director, Force Transformation.⁸ Not surprising given the fact that SECDEF reportedly told Congress, “[N]etwork-centric warfare should be the cornerstone of DoD’s strategic plan for the transformation of the forces.”⁹ These facts lead to the conclusion that NCO will become an accepted operational concept within DoD.

As each Service goes about its statutory responsibility to train and equip the armed forces of the 21st century with such new capabilities, the combatant Commanders-in-Chief (CINCs) (who will be the ones to employ these forces in a joint, combined or coalition environment) should be exploring the ramifications of NCO. One important area for exploration is the relationship between NCO and Operational Art.

⁵ Admiral Vern E. Clark to James R. Hogg, 20 September 2000, Strategic Studies Group Archives, “Memorandum for the Director, Strategic Studies Group,” Sims Hall, Newport, RI

⁶ Public Law 106-399, Section 934, National Defense Authorization Act for Fiscal Year 2001, Washington, DC: retrieved 10 January 2001 from the World Wide Web:

<http://thomas.loc.gov/cgi-bin/query/D?c106:1:./temp/~c106EjkzvH:e780471:>. Section 934 tasked SECDEF to submit a report on the development and implementation of NCW concepts within DoD.

⁷ Arthur K. Cebrowski, “Network-Centric Warfare Brief,” Lecture, U.S. Naval War College, Newport, RI: retrieved 5 October 2001 from the World Wide Web:

<http://www.nwc.navy.mil/pres/present/NCW%20Symposium%2014%20AUG%.../slide0647.html>. VADM Cebrowski quotes remark made by President G. W. Bush in February 2001.

Operational Art represents many things to many people. Some believe it denotes inviolate principles of war, while others think it refers to operational factors (space, time and forces) and operational functions, such as logistics, intelligence and fires. Above all, Op Art is a way of thinking. Modern Op Art originated in the Soviet Union during the 1920s¹⁰ and evolved in the United States into “the use of military force to achieve strategic goals through the design, organization, integration, and conduct of strategies, campaigns, major operations, and battles. ...Without op art, war would be a set of disconnected engagements, with relative attrition the only measure of success or failure.”¹¹ Joint Doctrine goes on to say, “The campaign is the central organizing instrument for joint warfare. ...The campaign is planned and executed by applying operational art.”¹² These statements all point to the criticality of Op Art as a core construct for future military success. Specifically, Op Art is founded on nineteen fundamental concepts, which include simultaneity and depth, balance, leverage, timing and tempo, forces and functions, arranging operations and centers of gravity.¹³ The application of these concepts has been a time-tested way of achieving political goals through military force.

How is the CINC to reconcile Network-Centric Operations with Operational Art?

⁸ Arthur K. Cebrowski, “Special Briefing on Force Transformation,” Briefing, Pentagon, Washington, DC: retrieved 28 November 2001 from the World Wide Web:

http://www.defenselink.mil/news/Nov2001/t11272001_t1127ceb.html, 1.

⁹ Ibid., 3.

¹⁰ Bruce W. Menning, “Operational Art’s Origins,” *Military Review* (September-October 1997): retrieved 8 January 2002 from the World Wide Web: <http://www-cgsc.army.mil/milrev/English/sepoct97/menning.html>

¹¹ Joint Chiefs of Staff, J-7, “Operational Art,” Joint Force Employment Briefings, March 1997, *Joint Electronic Library CD-ROM* (Washington, DC: Joint Chiefs of Staff, September 2001), 3.

¹² U.S. Joint Chiefs of Staff, *Joint Warfare of the Armed Forces of the United States*, Joint Pub 1 (Washington, DC: 14 November 2000), V-1.

¹³ U.S. Joint Chiefs of Staff, *Doctrine For Joint Operations*, Joint Pub 3-0 (Washington, DC: 10 September 2001), III-10. The other fundamental concepts of Op Art are synergy, anticipation, operational reach and approach, direct versus indirect, decisive points, culmination, and termination.

In order to reconcile NCO with Op Art, one must first examine the underlying assertions and assumptions of each construct and understand the interrelationships. Then, conclusions can be drawn, and recommendations made to future commanders.

One enduring principle needs to be addressed up front. As Clausewitz wrote almost two centuries ago, “War is more than a true chameleon that slightly adapts its characteristics to the given case. As a total phenomenon its dominant tendencies always make war a paradoxical trinity – composed of primordial violence, hatred, and enmity, which are to be regarded as a blind natural force; of the play of chance and probability within which the creative spirit is free to roam; and of its element of subordination, as an instrument of policy, which makes it subject to reason alone.”¹⁴

NCO does not change the fundamental nature of conflict. Computers do not replace humans. Certainty does not replace chance. Logic does not replace passion. However, conflict does adapt itself to the domain of cyberspace. Ultimately, war continues to be an endeavor of mankind through all means possible to “compel our enemy to do our will.”¹⁵

What are the underlying assumptions and assertions of NCO that affect Op Art?

Six key assumptions and assertions must be explored. First, advocates assert that NCO will collapse the strategic, operational and tactical levels of war. Since NCO possesses the capability to move information rapidly between levels and combat power can be strategically directed at the tactical level, some have suggested that the operational level of war will become “irrelevant.”¹⁶ Thus, the strategic level will interact directly with the tactical level.¹⁷ For example,

¹⁴ Carl von Clausewitz, On War, Michael Howard and Peter Paret eds. (Princeton: Princeton University Press, 1989), 89.

¹⁵ Ibid., 75.

¹⁶ Steven Metz, “The Next Twist of the RMA,” Parameters, (Autumn 2000), 51

¹⁷ Douglas A. Macgregor, “Future Battle: The Merging Levels of War,” Parameters, (Winter 1992-93), 42.

the National Command Authority will have greater capability to operate in the targeting process by approving or denying real-time requests to strike time-sensitive targets. Human nature reinforces the tendency of senior decision-makers to become involved at the tactical level. The tactical level appeals to the decision-maker because its primordial violence, hatred, and enmity are viscerally understood, and the tactical level gratifies immediately when successful in battle. NCO promises to make the operational level more transparent to the CINC and NCA. They will be able to look right through it to the tactical level and come to believe the operational level does not exist. Therefore, NCO will become a Siren Song to the tactical level of war.

In Greek mythology, Sirens lured sailors with their singing to crash their ships against the rocks in an effort to reach the sea nymphs. Two solutions were discovered to overcome the Siren Song. Odysseus ordered his crew's ears plugged with wax, himself bound to the mast, and restraints added when he asked to be released.¹⁸ Following this course of action in an NCO environment would result in the CINC receiving a one way feed of information to improve his situational awareness, but when he went to act on it he would be cut off from future information. The second way for the Siren Song to be overcome was provided by the Argonauts. They brought a renowned musician onboard, who drowned out the sea nymph's song with his own voice, and were thus able to pass safely.¹⁹ This solution offers some hope for the current NCO challenge. A more powerful song that keeps commanders at the operational level needs to be identified than the NCO song, which attracts decision-makers to the tactical level. Operational Art is that song.

¹⁸ Homer translated by George Herbert Palmer, The Odyssey (New York: Dover Publications, 1999), 115.

¹⁹ Encarta Desk Encyclopedia, "Sirens," 1998, Microsoft Bookshelf 2000 CD-ROM.

The operational level of war will not cease to exist. NCO allows decision-makers at the strategic level to provide direct input at the tactical level, but the operational level can only be ignored at great peril as the United States found out in Vietnam. The U.S. won at the tactical level, but tactical triumphs did not translate into strategic victory because America ignored the operational level of war and Operational Art.

NCO will facilitate senior civilian and military leaders' participation at the tactical level, but their involvement depends more on their leadership style than as an inherent trait of NCO. At the operational level, the CINC and his staff must be thoroughly familiar with Op Art in order to link tactical actions to strategic objectives in an NCO environment.

Second, NCO asserts that tactical actions will increasingly create strategic implications. With a high degree of situational awareness tactical commanders can take direct action to achieve strategic objectives. Historically, some tactical actions have resulted in strategic victory. During the Revolutionary War, Americans tactically defeated the British at Yorktown, which eventually led the British government to withdraw from the American colonies. It seems intuitive that tactical commanders who possess superior knowledge of the battlefield should be able to achieve strategic effects more readily. In fact, this capability may even be desirable in modern warfare, but Op Art cannot be ignored in this area either. "The principal role of operational art is to soundly sequence and synchronize or, simply stated, to 'orchestrate' the employment of military forces and nonmilitary sources of power to accomplish strategic and operational objectives in a given theater."²⁰ The most famous American examples come from World War II, General Eisenhower's campaign in Europe

²⁰ Milan N. Vego, Operational Warfare (Newport: Naval War College 2000), 1.

and General MacArthur's campaign in the Pacific. Op Art can realize the full potential of this new capacity to more effectively employ forces to achieve strategic objectives.

Third, NCO claims that operational pauses are no longer a consideration. One NCO proponent declares, “[I]f forces were networked to create near-real-time situational awareness, we could act continuously. We would no longer need to pause before deciding on further action; the information and coordination needed would already be there.”²¹ This statement has an inherent assumption that the whole force is networked, which is precarious given that in the foreseeable future allies and coalition partners will not be able to keep up with U.S. information technology advances.²²

Operational pauses result from more than lack of information and coordination. They are also caused by weaknesses in forces or logistics. The transition between Operation Desert Shield and Operation Desert Storm offers a poignant example. Shortage of strategic lift prevented a quick, decisive response by the United States, which allowed Iraq to build-up forces, loot Kuwait, and destroy oil field infrastructure. Moreover, operational-level pauses may even be planned to let diplomatic efforts catch up with military developments. Op Art advocates controlling the timing and tempo of conflict. Controlling the pace of warfare should be a principal goal. The ability to quicken or slow the pace of warfare puts the operational commander in control.

Fourth, NCO asserts that the non-linear nature of the NCO environment will prevent the successful application of Op Art elements. “Linearity refers primarily to the conduct of operations along lines of operations with identified forward lines of own troops. ...Nonlinear operations

²¹ Edward A. Smith, “Network-Centric Warfare: What’s the Point?” Naval War College Review (Winter 2001), 60.

emphasize simultaneous operations along multiple lines of operations from selected bases (ashore or afloat).”²³ NCO advocates proclaim conflict will become increasingly nonlinear, which is not to say that past military involvements have not been nonlinear.

Operation Uphold Democracy (OUD) was one such non-linear operation, where General Shelton controlled timing and tempo to achieve success by using arranging operations and forces and functions. OUD was planned as a phased campaign with the strategic objective of returning the democratically elected government to power, and military planning focused on creating a secure environment in Haiti as a precondition to achieving the strategic objective.²⁴ The focus on creating a secure environment to start was a lesson learned from operations in Somalia, where a secure environment was never reached. The phased campaign fully supported a secure environment objective. The first phase restored order and physical security in key areas, namely Port-au-Prince and Cap-Haitien. The second phase delivered humanitarian aid to the populace and expanded civil order to less populated areas. The third phase returned government function, and the last phase handed over control of operations to a United Nations-led Multi-National Force. The phased approach directly supported managing timing and tempo to achieve success.

Additionally, forces and functions were successfully employed by General Shelton to control timing and operational tempo. During the first phase of operations, forces were structured “to conduct violent combat operations.”²⁵ As the operation continued, the force structure was modified to control the pace of operations. The focus became peacekeeping, which required light, mobile

²² David C. Gompert, Richard L. Kugler, and Martin C. Libicki, Mind the Gap: Promoting a Transatlantic Revolution In Military Affairs, (Washington, DC: National Defense University Press, 1999), 8.

²³ Joint Pub 3-0, IV-8-IV-9.

²⁴ John R. Ballard, Upholding Democracy, the United States Military Campaign In Haiti 1994-1997, (Westport, Conn.: Praeger, 1998), 105.

forces. Firepower was traded for manpower. In a similar vein, functions also changed. A focus on psychological operations gave way to civil-military affairs. Rotating troops and headquarters in Haiti further controlled tempo. When 10th Mountain Division's readiness and energy dropped, the 25th Infantry Division was brought in to re-energize efforts to restore a secure environment, and before that event, JTF-180 was replaced by JTF-190 because JTF-180's mission was complete. These four techniques of forces and functions supported the Commander's objective of controlling timing and tempo to achieve success. Operation Uphold Democracy showed how Op Art could be used to accomplish strategic objectives in a nonlinear environment.

Fifth, the most vocal advocates of NCO shout that the quick tempo of future warfare will not allow a phased approach to operations. They point to the complex synchronization matrices that coordinate and deconflict actions.²⁶ They miss the point that tools will change but Op Art endures. For instance, Lieutenant General Franks, VII Corps Commander, was sharply criticized in the Gulf War for not pursuing the Iraqi ground forces more vigorously. During the initial ground assault, LTG Franks' halted the western prong of his attack because of the difficulty in synchronizing his large forces under darkness.²⁷ He thought the risk of fratricide was too high this early in the ground war. Later, LTG Franks realized he was too tactically focused and bound by synchronization. He started to look at the operational-level actions of the Iraqis. Based on this new way of thinking, LTG Franks changed his battle plan, synchronized his forces without complex

²⁵ Ibid., 125.

²⁶ Dahl, 10.

²⁷ Michael R Gordon and Bernard E. Trainor, The General's War (Boston: Little, Brown and Company, 1995), 380.

matrices, and attacked with better results.²⁸ Someday, NCO and Op Art may be combined to achieve even better results.

Additionally, as pointed out above, not all operations will be high intensity, unilateral efforts. Future warfare will also include military operations other than war and coalitions. NCO advocates do not believe that NCO will only address the upper end of the conflict spectrum. They say NCO will apply to the entire spectrum of conflict, as does Op Art.

Sixth, NCO asserts that faster decision cycles create quicker victory. This thinking goes to the very foundations of NCO. Advocates point to Colonel John Boyd's observe, orient, decide, and act (OODA) loop theory²⁹ as evidence that quick decision cycles will yield quick victories. "Ideally, the stimuli can be made numerous enough to overwhelm enemies with new developments, forcing them continually to revisit decisions, redirect efforts, and pause for observations, even to the point that they cannot ever take action."³⁰ This thinking implicitly assumes that the adversary uses an OODA loop. If the adversary uses a different mental paradigm than an OODA loop, then quick victories based on NCO capabilities maybe optimistic. Furthermore, in the long term, adversaries will adapt to the threat of NCO. No RMA lasts forever. They will either adopt NCO themselves or develop an effective counter. In short, NCO may make decision cycles faster, but quicker victories may not follow. The CINC needs to master the capabilities of NCO and understand its limitations.

What are the underlying assumptions and assertions of Op Art that affect NCO?

²⁸ Ibid., 398.

²⁹ John R. Boyd, "Patterns of Conflict," Lecture, (December, 1986): 6, retrieved 22 March 2001 from the World Wide Web: <http://www.d-n-i.net>

³⁰ Smith, 67.

Two key assumptions and assertions about Op Art are significant. First, Op Art can be applied to all levels of war. “The joint operational art encompasses the translation of strategy into operational design for the joint employment of forces at all levels of war. It integrates all force capabilities into a unified whole focused on the command’s major objectives.”³¹ Beyond doctrine, Op Art has been applied to all levels of war throughout history. Upon U.S. entry into World War II, President Roosevelt decided Europe had to be the first priority over Japan. This decision was an example of arranging operations at a strategic level. Europe would receive the main military effort then Japan.

Op Art was forged in the operational level of war, and examples of Op Art at the operational level can be cited from every conflict. But, over 2000 years ago, the elements of Op Art were formed in the Roman Legions to apply effective military force across a vast empire. At the tactical level of war, battles became larger than one person could adequately control, so Op Art was applied to orchestrate the instruments of force. As General Patton said, “There is still a tendency in each separate unit...to be a one-handed puncher. By that I mean that the rifleman wants to shoot, the tankier to charge, the artilleryman to fire. ...To get harmony in battle, each weapon must support each other. Team play wins.”³² Op Art was the means for the team to play to win.

Second, Op Art stresses that the level of decision-maker does not equate to the level of decisions. Decisions about force application and resource allocation are made at each level of war in order to achieve specific objectives. These decisions are most effective when made at the

³¹ Joint Pub 1, V-1.

³² Ibid.

commensurate level of war, but in a NCO environment, information will allow senior decision-makers to make informed decisions for lower level decision-makers. While this may be more efficient at the tactical level, it will not be more effective at the operational or strategic level. A recent operation illustrates the point. Commander-in-Chief Europe (CINCEUR) felt tremendous political pressure to achieve strategic results rapidly in Kosovo. In response, he watched unmanned air vehicle, real-time imagery during the normal course of his day to identify an enemy target for destruction. Once he made a decision, he called the Joint Forces Air Component Commander and ordered him to attack it. This sequence of events was efficient in the sense that pilots could strike a target that CINCEUR knew to be important for tactical reasons and would lead to satisfying strategic objectives. On the other hand, it turned out to be woefully ineffective with respect to achieving operational and strategic objectives. The CINC could have dramatically improved operational effectiveness by working with Allied governments to approve more target sets instead of identifying one tactical target for destruction.

Each level of war is complexity in motion and requires decision-makers to focus on their level and coordinate between levels. If decision-makers abandon their level of war only briefly to make decisions at a lower level, then effectiveness will be lost. This problem is not new to warfare, but the vast amount of information that NCO provides about the battlespace raises the stakes.

The operational level of warfare is difficult to master because it entails a different state of mind than the tactical level. Since operational commanders were once tactical commanders, they often find it difficult to make the mental transition to the operational level of warfare, especially under the stress of combat when instincts draw them back to the familiarity of tactics. However, mastering the operational level of warfare requires a different skill set, and Op Art is the framework for that

skill set. If the new skills are never learned, the operational commander will hold the position but not the requisite capabilities. Therefore, the decisions made will not be operationally focused and tactical in effect. On the other hand, modern warfare demands that the level of decisions produced equates to the billet level of decision-maker. The CINC must be on guard against commanders that are not thinking at the operational level of war because they are not imbued with an Op Art mindset.

What are some examples of Op Art concepts that show interrelationships with NCO?

Although all nineteen Op Art concepts relate to NCO, three concepts lend themselves to quick illustrations. They are balance, leverage, and timing and tempo. These illustrations show how Op Art concepts apply in a NCO environment to form a synergy that achieves strategic and operational objectives with unprecedented effectiveness. While not all NCO capabilities reside in the armed forces currently, all the capabilities mentioned in these vignettes are attainable.

First, “[b]alance is the maintenance of the force, its capabilities, and its operations in such a manner as to contribute to freedom of action and responsiveness.”³³ Logistics constitutes a core factor in preserving balance. The force must be sustained with food, fuel, water, and ammunition to retain its capabilities. Normally, this process requires substantial manpower to gather the requests for supplies, and inaccuracies in the requests often result in not receiving the correct amount or type of supplies. NCO makes in-stride sustainment possible.³⁴ Each time a tank shoots a round, the onboard system automatically generates a request to replace the specific type of ordnance. Water and fuel levels can also be monitored and restored. The delay between use and replacement and errors in amount or type drops drastically. Additionally, the destination of supplies becomes more

³³ Joint Pub 3-0, III-13.

accurate. Instead of the ammunition being sent to the battalion, it can be sent to the tank that fired. If the tank is disabled, the ordnance could be rerouted. Resupplying specific tanks became realistic with the deployment of the Global Positioning System. At the operational level, the commander could assess balance quickly by checking supply levels within his force, but he must keep in mind intangible factors such as fatigue and morale will not be displayed. Understanding the status of his forces at a glance, allows the commander freedom of action and responsiveness in a way not known before NCO.

Second, “[l]everage is gaining, maintaining, and exploiting advantages in combat power across all dimensions. Leverage allows Joint Force Commanders to impose their will on the enemy, increase the enemy’s dilemma, and maintain the initiative.”³⁵ Joint Pub 1 explains, “Attaining this advantage is the centerpiece of the operational art.”³⁶ NCO proponents proclaim information superiority will deliver leverage in every future war. “Achieving information superiority increases the speed of command preempting adversary options, creates new options, and improves the effectiveness of selected options. This promises to bring operations to a successful conclusion more rapidly at a lower cost.”³⁷ While keeping in mind that information is not an end in itself, information superiority used within the framework of Op Art would enable leverage to be gained, maintained, and exploited. Returning to LTG Franks in Operation Desert Storm provides an example. During the initial assault, if LTG Franks’ subordinate commanders knew where all their forces were located, they could have leveraged the breach in the Iraqi fortifications to continue the attack. They

³⁴ Chief of Naval Operations Strategic Studies Group XIX, Naval Power Forward (Newport, RI: September, 2000), 7-1.

³⁵ Joint Chiefs of Staff, J-7, “Operational Art,” 12.

³⁶ Joint Pub 1, V-2.

would not have halted their advance in the face of darkness and the enemy. As the fighting progressed, if LTG Franks had glimpsed GEN Schwarzkopf's situation map, he would have realized earlier that the Republican Guard was not preparing a counter-attack but was in full retreat. GEN Schwarzkopf counted on leverage to destroy the Republican Guard units before political pressure caused him to cease offensive operations.³⁸ NCO magnifies the impact that the Op Art concept of leverage can have on future operations.

Third, "[t]he joint force should conduct operations at a tempo and point in time that best exploits friendly capabilities and inhibits the adversary. With proper timing, [Joint Force Commanders] can dominate the action, remain unpredictable, and operate beyond the adversary's ability to react."³⁹ As stated earlier in this paper, the ability to quicken or slow the pace of warfare puts the operational commander in control. Unfortunately, the advocates of NCO fixate on speed of command, which entails making decisions faster than the enemy, and lockout. "Lockout refers to the situation that exists when an adversary's strategic objectives have been locked out because he has no remaining viable courses of action."⁴⁰ Speed of command links directly to the OODA loop already discussed. Faster does not mean better. Lockout, on the other hand, comes right from the Sirens' hit song list. No one has demonstrated it can be done. Chasing lockout becomes a dangerous distraction to achieving strategic and operational objectives.

NCO does possess attributes that will give the operational commander expanded capabilities to control timing and tempo. These attributes exist in knowledge: superior knowledge

³⁷ David S. Alberts, John J. Garstka and Frederick P. Stein, Network Centric Warfare: Developing and Leveraging Information Superiority, 2nd Edition (Revised) (Washington, DC: CCRP Publications, 1999), 55.

³⁸ Gordon and Trainor, 396.

³⁹ Joint Pub 3-0, III-15.

⁴⁰ Alberts, Garstka, and Stein; 165.

of own force capabilities, expanded ability to convey commander's intent and coordinate forces, improved knowledge of adversary's capabilities, and better knowledge of adversary's movements, patterns and available courses of action. To be clear, information resides in computers, which becomes knowledge when put in context by decision-makers. Once commanders share a common understanding of the operational situation, timing and tempo can be finessed with greater precision to control the pace of conflict.

What if the most ardent advocates of NCO are right and Op Art is obsolete?

The premise of this question comes from the belief that Op Art applies to the industrial age,⁴¹ while NCO applies to the information age.⁴² The answer to this question remains elusive because NCO has not been completely understood much less defined, but six trends that support NCO should be presented. Command and control can be exercised over a larger area from the strategic level directly to the tactical level. Forces grow smaller but more skilled. Capabilities become distributed across a force that disperses itself for protection. Combat effects mass not forces. Time compresses due to the fast tempo of decisions. Finally, information spreads throughout the force to build shared awareness of the battlespace, which leads to victory. If all these trends continue, the impact will be enormous. Not the least of which will be the abolishment of regional CINCs. In the distant future, operations may very well be commanded from the strategic level and the need "to orchestrate the employment of military forces and nonmilitary

⁴¹ James J. Schneider, "The Loose Marble – and the Origins of Operational Art," Parameters (March 1989), 94.

sources of power”⁴³ to accomplish objectives obsolete. Until that time, Op Art has a role to play in the transition.

What conclusions can be drawn about Op Art and the future NCO environment?

The moderate proponents of NCO said it best when they wrote: “To reach its full potential Network Centric Warfare must be deeply rooted in operational art.”⁴⁴ Both constructs occupy the same trade space. They both apply to all the Services. They both apply across the levels of war and across the spectrum of conflict. Both will be needed in the future to maintain American military dominance in the battlespace. In short, Op Art provides the framework to channel the power of NCO.

Each Service, supported by senior civilian and military leaders, advances its own program to develop and implement NCO. These new network-centric capabilities are already starting to reach the CINC, but the integration of Service programs into joint capabilities presents a different challenge than in the past. This RMA requires horizontal integration to succeed. Information will not spread across the force unless Army, Navy, Marine Corps, Air Force, and Coast Guard interfaces and protocols match. Furthermore, the pace of NCO implementation will accelerate under the influence of Admiral Cebrowski as the Director, Force Transformation.

The CINC faces a difficult challenge. Commanders must be firmly grounded in Op Art and learn the strengths and limitations of each iteration of NCO capabilities that a newly deployed force brings to the theater. The challenge gains a greater degree of difficulty when these increased capabilities need to be employed in an allied, combined, or coalition environment. Although the

⁴² U.S. Naval War College Faculty, Network Centric Operations: A Capstone Concept for Naval Operations in the Information Age (Newport, RI: September 2000), 5.

challenge is daunting, the reward is worthwhile. A synergy will form between Op Art and NCO that achieves operational and strategic objectives with unprecedented effectiveness.

What recommendations should be made to the CINC to reconcile NCO and Op Art?

Above all, war remains a paradoxical trinity, subordinate to policy, and subject to reason alone.⁴³ Beyond that enduring principle, six recommendations emerge. First, ignore the Siren Song that draws strategic and operational leaders to the tactical level. The three levels of war will survive and adjust to the NCO environment, but Op Art concepts must be heeded in order to link tactical actions to operational and strategic objectives. Second, look for tactical opportunities to achieve strategic effects. NCO capabilities could provide new dimensions to leverage strengths and protect weaknesses. Third, control the pace of operations by using NCO capabilities to precisely direct timing and tempo. The pace of operations needs to be regulated in linear as well as nonlinear circumstances. Fourth, develop new Op Art tools that conform to the NCO environment. If complex synchronization matrices no longer apply, establish simple rule sets to harmonize movement. Fifth, guard against operational commanders who are not thinking or acting at the operational level of war. Modern warfare requires that the level of decisions produced equals the billet level of the decision-maker. Sixth, provide Services design input to NCO capabilities. All NCO capabilities merge for the first time in a CINC's theater.

In conclusion, Network-Centric Operations and Operational Art are not mutually exclusive but mutually supporting constructs. NCO does not make Op Art obsolete as some critics suggest, but Op Art tools will require modification to fully exploit the potential of NCO. By understanding

⁴³ Vego, 1.

⁴⁴ Alberts, Garstka, and Stein; 3.

the fundamental assertions, assumptions, and interrelationships, a synergy appeared that accomplishes strategic and operational objectives with extraordinary effectiveness. This unexpected finding heralds a new odyssey for the CINC to comprehend, cultivate, and control.

Bibliography

Adams, Thomas K. "The Real Military Revolution." Parameters (Autumn 2000): 54-65.

Alberts, David S., John J. Garstka and Frederick P. Stein. Network Centric Warfare: Developing and Leveraging Information Superiority, 2nd Edition (Revised). Washington, DC: CCRP Publications, 1999.

Ballard, John R. Upholding Democracy, the United States Military Campaign In Haiti 1994-1997. Westport, Conn.: Praeger, 1998.

Barnett, Thomas P. M. "The Seven Deadly Sins of Network-Centric Warfare." U.S. Naval Institute Proceedings, (January 1999): 10.

Boyd, John R. "Patterns of Conflict." Lecture. (December, 1986): retrieved 22 March 2001 from the World Wide Web: <http://www.d-n-i.net>

Caneva, Joseph W. "Network-Centric Warfare: Implications for Applying the Principles of War." Unpublished Research Paper, U.S. Naval War College, Newport, RI: May 1999.

Cebrowski, Arthur K. "Network-Centric Warfare Brief." Lecture. U.S. Naval War College, Newport, RI: retrieved 5 October 2001 from the World Wide Web: <http://www.nwc.navy.mil/pres/present/NCW%20Symposium%2014%20AUG%.../slide0647.html>

_____. "Special Briefing on Force Transformation." Briefing. Pentagon, Washington, DC: retrieved 28 November 2001 from the World Wide Web: Http://www.defenselink.mil/news/Nov2001/t11272001_t1127ceb.html

Cebrowski, Arthur K. and John J. Gartska. "Network-Centric Warfare: Its Origin and Future." U.S. Naval Institute Proceedings (January 1998): 28-35.

Chairman of the Joint Chiefs of Staff. Joint Vision 2020. America's Military: Preparing for Tomorrow. Office of the Chairman of the Joint Chiefs of Staff, Washington, D.C.: June 2000.

⁴⁵ Clausewitz, 89.

Chief of Naval Operations Strategic Studies Group XIX. Naval Power Forward. Newport, RI: September, 2000.

Clark, Vernon E., to James R. Hogg. 20 September 2000. Strategic Studies Group Archives. "Memorandum for the Director, Strategic Studies Group." Sims Hall. Newport, RI

Clausewitz, Carl von. On War. Michael Howard and Peter Paret eds. Princeton: Princeton University Press, 1989.

Dahl, Erik J. "Network Centric Warfare and the Death of the Operational Art." Unpublished Research Paper, U.S. Naval War College, Newport, RI: November 2001.

Duffy, Daintry. "Information Is A Weapon. What Will Happen When Every Soldier is Armed With It?" Darwin Magazine (November 2001); received as e-mail.

Encarta Desk Encyclopedia. "Sirens." 1998. Microsoft Bookshelf 2000 CD-ROM.

Gompert, David C., Richard L. Kugler, and Martin C. Libicki. Mind the Gap: Promoting a Transatlantic Revolution In Military Affairs. Washington, DC: National Defense University Press, 1999.

Gordon, Michael R. and Bernard E. Trainor. The General's War. Boston: Little, Brown and Company, 1995.

Hammes, T. X. "War Isn't a Rational Business." U.S. Naval Institute Proceedings (July 1998): 22-25.

Handel, Michael I. Masters of War: Classical Strategic Thought, 3rd ed. London: Cass, 2001.

Helms, Chet. "A Short History of Operational Art." Unpublished Research Paper, U.S. Naval War College, Newport, RI: October 1999.

Homer translated by George Herbert Palmer. The Odyssey. Mineola, New York: Dover Publications, 1999.

Johnson, Jay L. to President, National Academy of Sciences. 29 April 1998. "Letter to President, National Academy of Sciences." Quoted in Naval Studies Board, Network-Centric Naval Forces: A Transition Strategy for Enhancing Operational Capabilities, Appendix A. Washington, DC: National Academy Press, 2000.

- Krepinevich, Andrew F. "Cavalry to Computer: The Pattern of Military Revolutions," in Strategy and Force Planning Faculty, eds., Strategy and Force Planning, 3rd ed., Newport, RI: Naval War College Press, 2000, pp. 480-496.
- Lescher, William K. "Network-Centric: Is it Worth the Risk?" U.S. Naval Institute Proceedings (July 1999): 58-63.
- Locks, John T. "NCW Fundamentals." Unpublished Research Paper, U.S. Naval War College, Newport, RI: undated.
- Macgregor, Douglas A. "Future Battle: The Merging Levels of War." Parameters, (Winter 1992-93): 33-47.
- Meigs, Montgomery C. "Operational Art in the New Century." Parameters, (Spring 2001): 4-14.
- Menning, Bruce W. "Operational Art's Origins." Military Review (September-October 1997): retrieved 8 January 2002 from the World Wide Web: <http://www-cgsc.army.mil/milrev/English/sepoct97/menning.html>
- Metz, Steven. "The Next Twist of the RMA." Parameters (Autumn 2000): 40-53.
- Naval Studies Board. Network-Centric Naval Forces: A Transition Strategy for Enhancing Operational Capabilities. Washington, DC: National Academy Press, 2000.
- Owens, William A. with Ed Offley. Lifting the Fog of War. New York: Farrar, Strauss and Giroux, 2000.
- Public Law 106-399, Section 934. National Defense Authorization Act for Fiscal Year 2001. Washington, DC: retrieved 10 January 2001 from the World Wide Web: <http://thomas.loc.gov/cgi-bin/query/D?c106:1:./temp/~c106EjKzvH:e780471:>
- Scarborough, Sheila. "Network-Centric Warfare Meets the Laws of the Navy." U.S. Naval Institute Proceedings (May 2001): 30-33.
- Schneider, James J. "The Loose Marble – and the Origins of Operational Art." Parameters (March 1989): 85-99.
- Schroeder, Michael C. "The Issue of Command and Control in Network Centric Systems." Unpublished Research Paper, U.S. Naval War College, Newport, RI: February 2001.
- Sickert, Mark R. "Network-Centric Warfare and the Operational Concepts of War: A Synergistic Effect." Unpublished Research Paper, U.S. Naval War College, Newport, RI: May 2000.

Simmons, Robert. "Control in an Age of Empowerment." Harvard-Business Review (March-April 1995): 80-88.

Slim, Sir William. "Higher Command in War." Kermit Roosevelt Lecture. U.S. Army Command and General Staff College, Leavenworth, KA: undated.

Smith, Edward A. "Network-Centric Warfare: What's the Point?" Naval War College Review (Winter 2001): 59-75.

U.S. Joint Chiefs of Staff. Doctrine For Joint Operations. Joint Pub 3-0. Washington, DC: 10 September 2001.

_____. Joint Warfare of the Armed Forces of the United States. Joint Pub 1. Washington, DC: 14 November 2000.

U.S. Joint Chiefs of Staff, J-7. "Operational Art." Joint Force Employment Briefings. March 1997. Joint Electronic Library CD-ROM. Washington, DC: Joint Chiefs of Staff, September 2001.

U.S. Naval War College Faculty. Network Centric Operations: A Capstone Concept for Naval Operations in the Information Age. Newport, RI: September 2000.

U.S. Secretary of Defense. Annual Report to the President and Congress. Washington, DC: retrieved 29 November 2001 from the World Wide Web: <http://www.dtic.mil/execsec/adr2001>.

Vego, Milan N. Operational Warfare. Newport: Naval War College, 2000.

Wiersema, Richard E. "The Future of War: Is Operational Art Now Impossible?" Unpublished Monograph, School of Advanced Military Studies, U.S. Army Command and General Staff College, Fort Leavenworth, KA: May, 1998.

Zimmerman, John D. "Command and Control in a Network Centric Environment." Unpublished Research Paper, U.S. Naval War College, Newport, RI: February 2001.